

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 895 282 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
26.01.2000 Bulletin 2000/04

(51) Int Cl.⁷: **H01L 21/762**, H01L 21/20,
H01L 23/66, H01L 23/528

(43) Date of publication A2:
03.02.1999 Bulletin 1999/05

(21) Application number: **98305994.0**

(22) Date of filing: **28.07.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **30.07.1997 JP 20451897**

(71) Applicants:
• **CANON KABUSHIKI KAISHA**
Tokyo (JP)
• **TADAHIRO OHMI**
Sendai-shi, Miyagi-ken (JP)
• **Ultraclean Technology Research Institute**
Tokyo 113-0033 (JP)

(72) Inventors:
• **Ohmi, Tadahiro**
Sendai-shi, Miyagi-ken (JP)

• **Ushiki, Takeo**
Aoba-ku, Sendai-shi, Miyagi-ken (JP)
• **Tanaka, Nobuyoshi**
Ohta-ku, Tokyo (JP)
• **Shinohara, Toshikuni**
Sendai-shi, Miyagi-ken (JP)
• **Nitta, Takahisa**
Bunkyo-ku, Tokyo (JP)

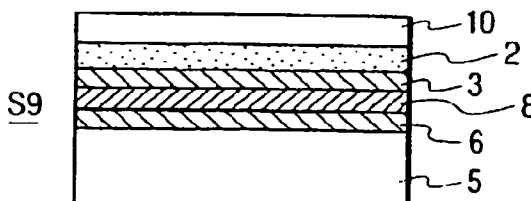
(74) Representative:
Beresford, Keith Denis Lewis et al
BERESFORD & Co.
High Holborn
2-5 Warwick Court
London WC1R 5DJ (GB)

(54) **Method of preparing a SOI substrate by using a bonding process, and SOI substrate produced by the same**

(57) A semiconductor substrate adapted to giga-scale integration (GSI) comprises a support, at least the surface of which is made of semiconductor, an electroconductive material layer, an insulating layer and a semiconductor layer arranged sequentially in the above order. The electroconductive material layer has at least in part thereof an electroconductive reacted layer obtained

by causing two metals, a metal and a semiconductor, a metal and a metal-semiconductor compound, a semiconductor and a metal-semiconductor compound, or two metal-semiconductor compounds to react each other. An electroconductive reaction terminating layer that is made of a material that does not react with the reacted layer is arranged between the reacted layer and the insulating layer or the support.

FIG. 11



EP 0 895 282 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 5994

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 5 387 555 A (LINN JACK H ET AL) 7 February 1995 (1995-02-07) * figure 4A * * column 2, line 59 - column 3, line 5 * * column 3, line 30 - column 4, line 10 * * column 8, line 18 - line 42 * ---	1-44	H01L21/762 H01L21/20 H01L23/66 H01L23/528
A	US 5 102 821 A (MOSLEHI MEHRDAD M) 7 April 1992 (1992-04-07) * abstract; claims 1,3,4 * * column 1, line 27 - line 31 * * column 2, line 17 - line 45 * * column 4, line 10 - line 15 * ---	1-44	
A	EP 0 256 397 A (HITACHI LTD) 24 February 1988 (1988-02-24) * figures 3A1,3A2 * * column 4, line 51 - column 5, line 15 * * claim 4 * ---	1-44	
D,A	PATENT ABSTRACTS OF JAPAN vol. 018, no. 461 (E-1597), 26 August 1994 (1994-08-26) & JP 06 151789 A (CANON INC), 31 May 1994 (1994-05-31) * abstract * ---	1-44	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H01L
A	EP 0 552 466 A (HONDA MOTOR CO LTD) 28 July 1993 (1993-07-28) * column 4, line 40 - column 5, line 4; figure 1 * ---	1-44	
A	EP 0 238 066 A (FUJITSU LTD) 23 September 1987 (1987-09-23) * abstract * * column 9, line 13 - line 15 * -----	9,35	
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 26 November 1999	Examiner Le Meur, M-A
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosures P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 92 (No.C61)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 30 5994

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-11-1999

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5387555	A	07-02-1995	US 5569620 A	29-10-1996
			US 5849627 A	15-12-1998
US 5102821	A	07-04-1992	EP 0488344 A	03-06-1992
			JP 6097400 A	08-04-1994
			US 5373184 A	13-12-1994
EP 0256397	A	24-02-1988	JP 1910036 C	09-03-1995
			JP 6038424 B	18-05-1994
			JP 63036566 A	17-02-1988
			DE 3776735 A	26-03-1992
			US 4794445 A	27-12-1988
JP 06151789	A	31-05-1994	NONE	
EP 0552466	A	28-07-1993	JP 5200539 A	10-08-1993
EP 0238066	A	23-09-1987	JP 2559700 B	04-12-1996
			JP 62216352 A	22-09-1987
			US 4826787 A	02-05-1989

EPO FORM P459

For more details about this annex : see Official Journal of the European Patent Office. No. 12/82

THIS PAGE BLANK (USPTO